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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,362	02/07/2005	Agnes Chardonnens	13311-00012-US	1864

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EXAMINER	
KUMAR, VINOD	

ART UNIT	PAPER NUMBER
1638	

MAIL DATE	DELIVERY MODE
11/06/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/523,362	CHARDONNENS ET AL.	
	Examiner	Art Unit	
	VINOD KUMAR	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5,8-11,13,15,18,19,29,32,47 and 49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,8-11,13,15,18,19,29,32,47 and 49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 May 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

2. Applicant's response filed in the paper of October 20, 2008 is entered.

3. Claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 are pending.

4. Claims 2-4, 6-7, 12, 14, 16-17, 20-28, 30-31, 33-46, 48 and 50 are previously cancelled.

5. Claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 are examined on merits in the present Office action.

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Rejection of claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 under 35 U.S.C. 103(a) as being unpatentable over Gan (Biochem. Biophys. Res. Comm., 187:949-955, 1992) in view of Valvekens et al. (PNAS, 85:5536-5540, 1998) and Grant et al. (Biochimica et Biophysica Acta, 1490:33-42, 2000) is withdrawn upon further consideration. Accordingly, Applicant's arguments pertaining to this rejection filed in the paper of October 20, 2008 are rendered moot.

Claim Objections

8. Claim 18, 29, 47 and 49 are objected due to following informalities:

Claims 18, 19, 29, 47 and 49 are objected for not reciting the full-form for "ORSRP".

Claim Rejections - 35 USC § 112

9. Claims 8-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is necessitated by amendment.

Claims 8-11 are rejected under 112, second paragraph as being indefinite in the recitation "derived" in claims 8-11, which is confusing, since it is unclear what is retained in the "derived" product. It is suggested to change "derived" to --obtained--.

10. Claim 18 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 18 recite "having the activity of an ORSRP" which introduces **NEW MATTER** into amended claims. The specification does not provide written description support for "having the activity of an ORSRP". It is important to note that the breadth of the recitation reads on any ORSRP activity. The specification does not provide written description support for any ORSRP activity for sequences having at least 95% identity to SEQ ID NO: 4.

This does not comply with written description requirements.

Double Patenting

11. Claims 1, 5, 8-11, 13, 15, 18, 19, 29, 32, 47 and 49 remain provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being

unpatentable over claims 2, 10, 11, 12, 15, 16, 19, 22, 23 and 24-27 of co-pending Application No. 11/251,208. Although the conflicting claims are not identical, they are not patentably distinct from each other for the reasons of record stated in the Office action mailed on November 3, 2006.

Applicant's response filed in the paper of October 20, 2008 states that Applicant proposes to file terminal disclaimer upon the indication of allowable subject matter (response, pg 5, lines 13-18). Accordingly, the rejection is maintained.

Claim Rejections - 35 USC § 103

12. Claims 1, 5, 8-10, 13, 18-19, 29, 32, 47 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lanahan et al. (WIPO, PCT, WO 00/36126, Published 22 June 2000, Applicant's IDS), and further in view of Gan (Biochem. Biophys. Res. Comm., 187:949-955, 1992), Grant et al. (Biochimica et Biophysica Acta, 1490:33-42, 2000) and Samuelsen et al. (Plant Physiol., 118:51-58, 1998).

Lanahan et al. teach a plant expression cassette, an expression vector, transgenic plant cell, transgenic plant and a method of producing said transgenic plant cell or plant comprising said expression cassette, which comprises a nucleotide sequence encoding a heat-stable thioredoxin protein (an oxidoreductase stress related protein), or wherein said transgenic plant cell or plant is a monocotyledonous (maize) or a dicotyledonous (tomato) plant. The reference also teaches that said nucleotide sequence is operably linked to a promoter (same as regulatory sequence). The reference also teaches that said expression cassette also comprises a coding sequence encoding an organelle (e.g. plastid) target signal operably linked to said nucleotide

sequence. Lanahan et al. also teach expressing microbial heat-stable thioredoxin proteins in transgenic plants. See abstract; pages 1-2, 6-7, 11-13, 17, 20-31; examples 1-2; SEQ ID NOs: 1-7.

Lanahan et al. do not teach instant SEQ ID NO: 3 encoding SEQ ID NO: 4.

Gan teach a nucleic acid sequence encoding yeast thioltransferase (also called glutaredoxin), wherein said nucleic acid sequence has 100% sequence identity with instant SEQ ID NO: 3 which encodes a yeast glutaredoxin protein of SEQ ID NO: 4. Furthermore instant SEQ ID NO: 4 has also 100% sequence identity to the amino acid sequence of glutaredoxin taught in the reference. The reference further teaches that glutaredoxin protein participates in the reduction of low molecular weight and protein disulfides in the presence of glutathione.

Grant et al. teach that yeast glutaredoxins are small heat-stable oxidoreductases which play an important role in protecting a cell exposed to environmental stresses. The reference also teaches that the expression of GRX1 and GRX2 (yeast glutaredoxins) was up-regulated by a range of stress conditions including oxidative, heat shock, osmotic (includes salinity) etc (pg 40, 3rd paragraph). Also see abstract, pages 33, 34; page 35, figure 1; page 36, figure 2; page 37, figure 3; page 38, figure 4; page 39, figure 5; pages 40-41.

Samuelsen et al. teach that yeast genes can be successfully expressed in plants to obtain expected phenotype and/or enzymatic activity associated with the yeast protein. See in particular, pg 51, abstract; pg 54, figures 1 and 2; pg 55, figure; pg 56, figures 4. The reference also cites additional prior art references to assert that

expressing yeast genes in plant tissue produces expected results (see pg 51, right column, 3rd paragraph).

At the time the invention was made, it would have been prima facie obvious to one of ordinary skill in the art to modify the method of making a transgenic plant as taught by Lanahan et al., to substitute the coding sequence encoding Lanahan et al. heat-stable thioredoxin protein with a recombinant DNA encoding Gan thioredoxin protein to obtain a transgenic plant and transgenic seed expressing Gan recombinant DNA.

It would have been thus obvious and within the scope of an ordinary skill in the art to over-express Gan glutaredoxin protein in any plant including monocot (maize) or dicot (tomato) plants of Lanahan et al. using any plant transformation method including the one taught by Lanahan et al.

Given that Grant et al. teach that glutaredoxin protein (same protein as taught by Gan, emphasis added) are implicated in protecting a cell subjected to an environmental stress (oxidative or osmotic or salinity), one of ordinary skill in the art would have been motivated to over-express Gan nucleic acid sequence encoding glutaredoxin protein in any eukaryotic host cell including a plant cell to produce a transgenic plant cell which is regenerated into a stress-tolerant transgenic plant with a reasonable expectation of success.

Given, it was well known in the art at the time the instantly claimed invention was made that yeast genes can be overexpressed in a plant to produce an expected phenotype as asserted by Samuelsen et al., it would have been obvious and within the scope of an ordinary skill in the art to try to over-express Gan's Oxidoreductase coding

sequence in a plant for the purpose of obtaining environmental (salt, drought etc.) stress tolerant transgenic plant with a reasonable expectation of success.

It is further maintained that it would have been obvious and within the scope of an ordinary skill in the art to use Gan nucleic acid sequence encoding the glutaredoxin protein as a DNA marker in any DNA hybridization based technique, such as Southern blot or DNA dot blot analysis to identify stress-tolerant transgenic plant with a reasonable expectation of success.

Thus, the claimed invention as a whole is prima facie obvious over the combined teachings of the prior art.

13. Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lanahan et al. (WIPO, PCT, WO 00/36126, Published 22 June 2000, Applicant's IDS), and further in view of Gan (Biochem. Biophys. Res. Comm., 187:949-955, 1992), Grant et al. (Biochimica et Biophysica Acta, 1490:33-42, 2000), Samuelsen et al. (Plant Physiol., 118:51-58, 1998) and Stomp et al. (Plant Physiol., 92:1226-1232, 1990).

Lanahan et al. teachings are discussed supra.

Lanahan et al. do not teach transforming a gymnosperm plant cell or plant.

Gan teachings are discussed supra.

Grant et al. teachings are discussed supra.

Samuelsen et al. teachings are discussed supra.

Stomp et al. teach a method of transforming *Pinus* (a gymnosperm) species. See in particular, pg 226, abstract; pgs 226-227, materials and methods.

It would have been thus obvious and within the scope of an ordinary skill in the art to over-express Gan glutaredoxin protein in any plant cell or plant including a

gymnosperm plant cell or plant using any plant transformation method including the one taught by Stomp et al. to arrive at the claimed invention with a reasonable expectation of success as discussed above.

Conclusions

14. Claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 remain rejected.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VINOD KUMAR whose telephone number is (571)272-4445. The examiner can normally be reached on 8.30 a.m. to 5.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Phuong T. Bui/
Primary Examiner, Art Unit 1638